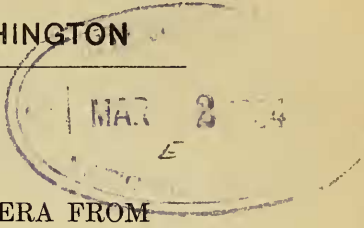


PROCEEDINGS
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SOME FURTHER NEW THYSANOPTERA FROM
PANAMA.

BY J. DOUGLAS HOOD.

In two previous papers¹ the author described a number of new Panamanian Thysanoptera taken during the summer of 1933, principally at Barro Colorado Island, Canal Zone, and at Porto Bello. Most of these were outstanding species which required little study for their differentiation. In the present paper are described certain additional ones, belonging to more difficult genera, as well as a few which were collected under the direction of Mr. James Zetek by Silvestre Aviles, one of the resident care-takers of the Barro Colorado Island Biological Laboratory.

A set of paratypes, in so far as they exist, will be deposited with Dr. Thomas Barbour, Director of the Museum of Comparative Zoology of Harvard University, while the holotypes and allotypes will remain in the writer's collection.

Heterothrips flavicuris, sp. nov.

Female (macropterous).—Length about 1 mm. (distended, 1.2 mm.). Color brown, darkest in head, palest in abdominal segments III-VIII, prothorax with a little red subhypodermal pigmentation along front and hind margin as well as on lower surface and in median line, the pterothorax and base of abdomen with orange pigmentation which here and there becomes reddish; ocellar pigmentation red; femora blackish brown, the fore pair yellow at tip, the middle and hind pairs yellow at base only, *all tibiae and tarsi pale yellow*, excepting only the brown tarsal cups; fore wings gray, *with a clear white subbasal cross-band; antennae largely pale whitish yellow in segments I-VI, uniform dark gray in VII-IX*, segment I lightly shaded with brown basally, III just perceptibly darkened apically,

¹*Three New Urothripidae from Panamá*, in Proc. Biol. Soc. Washington, Vol. 46, pp. 213-215, Nov. 20, 1933; and *New Thysanoptera from Panamá*, in Journ. N. Y. Ent. Soc., Vol. XLI, pp. 407-434, Feb., 1934.

IV with a narrow gray encircling band occupying the portion between the circle of major setæ and the sensoria and another band occupying the extreme apex of the segment beyond the sensoria, V gray in the very short broad pedicel and also in distal third, VI gray in pedicel and in distal half.

Head about 1.65 times as wide as long, widest about midway between eyes and base, cheeks arcuately rounded and minutely serrulate because of six or seven deep anastomosing striæ on occiput; frontal costa with emargination minute and V-shaped; ocellar area and eyes at posterior margins not delimited by the heavy dark chitinous line found in some species, the head thus without a transverse occipital groove. *Eyes* of normal form and structure, i. e., about 0.7 as long as head, setose, protruding anteriorly, with the dorsal facets smaller than the ventral ones and separated from one another. *Ocelli* of posterior pair about twice the diameter of anterior ocellus and two-thirds as wide as their interval. *Antennæ* about 2.16 times as long as pronotum, of normal form and structure; segment III only 2.5 times as long as greatest width, its length from base to third incision just one-half the length of segment IV; IV less than 0.7 as long as III, its sides arcuate; each of these segments with two rings of encircling sensoria at tip.

Prothorax about 1.43 times as long as head and about 1.65 times as wide as long, broader posteriorly, with sides and posterior margin rounded and anterior margin nearly straight; notum with a few short dark setæ and the usual longer ones at anterior angles and along posterior margin, the anastomosing lines of sculpture pale and inconspicuous. Mesonotum very closely striate. *Wings* of fore pair with about 23 setæ on costal margin, 23 on anterior vein, and 18 on posterior vein.

Abdomen stout (as is usual in the genus); *pubescence* dark, close, and very regular, disposed as usual on anastomosing lines, these not heavy or especially prominent; *posterior margins of abdominal terga I-VIII fringed at sides with dark parallel slender spines which are not at all fused to form plates*, I bare on posterior margin at median line, II with two minute spines at this point, III with 8, IV and V each with 11, VI-VIII with the comb continuous and unbroken; sterna II-VI each fringed posteriorly with a continuous even comb and with a single regular row of dark setæ arising close to their posterior margins, sternum V with 12 of these setæ.

Measurements of holotype (♀): Length about 0.98 mm. (distended, 1.19 mm.); head, length 0.090 mm., greatest width 0.149 mm., width across eyes 0.148 mm., least width (at base) 0.136 mm.; eyes, length 0.063 mm., width 0.048 mm., interval 0.052 mm.; prothorax, median length of pronotum 0.129 mm., width 0.213 mm.; pterothorax greatest width 0.269 mm.; abdomen, greatest width 0.284 mm.

Antennal segments:	1	2	3	4	5	6	7	8	9
Length (μ):	22	39	67	46	29	28	15	15	17
Width (μ):	29	26	27	27	18	15	10	8	5
Total length of antenna 0.278 mm.									

Described from one female taken by Silvestre Aviles in flowers of *Brysonima coriacea* [Dr. Paul C. Standley, det.], Barro Colorado Island, Canal Zone, August 6, 1933 [Hood No. 1037].

The presence of spines, rather than chitinous plates, on the posterior margins of the abdominal terga, the unbroken comb on the sixth tergum, the banded fore wings, the yellow tibiæ, and the dark femora ally this species with *minor* and *brasiliensis*. From the former it differs in having much paler antennæ, the second segment being clear yellow instead of concolorous with the head, and segments five and six being largely whitish yellow instead of uniform dark brown; in the presence of a group of distinct median spines on the posterior margins of each of the abdominal terga from the second to the fifth; and also in having two rings of circular sensoria, instead of only one, at the apex of the third and fourth antennal segments. From *brasiliensis* it differs in the less closely sculptured pronotum and also in the much paler antennal coloration, *brasiliensis* having the first two and the last five segments dark brown.

Heterothrips pubescens, sp. nov.

Female (macropterous).—Length about 1.1 mm. (partially distended, 1.2 mm.). Color dark brown or blackish brown (black to the naked eye), thorax and abdomen with orange-colored subhypodermal pigmentation; ocellar pigmentation red; femora concolorous with body, the fore pair yellow apically, the middle and hind pairs yellow at extreme base only; fore tibiæ deep yellow, with a brown cloud in basal half or more, shading to lemon yellow at tip; middle tibiæ blackish brown, paler at base, lemon yellow in distal fourth; hind tibiæ colored much like middle tibiæ but pale yellowish brown at base; all tarsi pale yellow, with dark brown tarsal cups; fore wings dark gray, with a clear white subbasal cross-band; antennæ with segment I light brownish gray, II uniform orange-yellow, III clear yellow, IV yellow with a slight cloud of gray over most of distal portion exclusive of sensoria, V–IX uniform dark gray-brown.

Head about 1.68 times as wide as median dorsal length and 0.7 as long as prothorax, decidedly broadest just behind eyes (where it is abruptly widest and provided with a tooth-like projection), tapering concavely to base; surface with a few small setæ; ocellar area and eyes at posterior margins delimited by a dark chitinous line which crosses the head as the anterior margin of a distinct transverse occipital groove, behind which are about six dark anastomosing lines; frontal costa with a deep U-shaped emargination. Eyes of normal form and structure, 0.7 as long as head, nearly 0.9 as wide as their interval. Ocelli of posterior pair about twice the diameter of anterior ocellus and about 0.6 as wide as their interval. Antennæ about 2.76 times as long as median length of head and twice that of pronotum, of normal form and structure; segment III about 2.76 times as long as greatest width, its length from base to third incision about three-fourths the length of segment IV; IV only 0.57 as long as III, its sides arcuate.

Prothorax about 1.36 times as long as head and about 1.6 times as wide as long, sides and posterior margin rounded, the latter roundly emarginate medially, front margin straight; notum with a few short inconspicuous setæ and the usual longer ones on anterior and posterior angles, its surface nearly rugose, the anastomosing lines almost forming polygons. Mesonotum

closely striate. Wings of fore pair with about 26 setæ on costal margin, 22 on anterior vein, and 17 on posterior vein.

Abdomen stout (as is usual in the genus); *pubescence* close, the larger *reticles* crossed by about six delicate spines; posterior margins of *terga* I-VII fringed at sides with chitinous plates whose distal ends are prolonged as usual into flat acute spines, the spines short and evenly spaced on the more lateral plates, shorter and less regular on the mesad ones; *tergum* I broadly bare across middle, II-V with 4-9 small spines forming a median group on posterior margin, VI-VIII with the comb continuous and unbroken.

Measurements of holotype (♀): Length about 1.12 mm. (partially distended, 1.23 mm.); head, length 0.095 mm., greatest width (just behind eyes) 0.160 mm., least width (at base) 0.136 mm., width across eyes 0.155 mm.; eyes, length 0.067 mm., width 0.049 mm., interval 0.057 mm.; posterior ocelli, diameter 0.017 mm., interval 0.027 mm.; prothorax, median length of pronotum 0.130 mm., width 0.210 mm.; pterothorax, greatest width 0.260 mm.; abdomen, greatest width (at segment IV) 0.347 mm.

Antennal segments:	1	2	3	4	5	6	7	8	9
Length (μ):	23	38	69	39	23	22	15	15	19
Width (μ):	32	29	25	25	20	16	11	9	6
Total length of antenna 0.263 mm.									

Described from two females taken in flowers of *Byrsonima coriacea* [Dr. Paul C. Standley, det.], on Barro Colorado Island, Canal Zone, August 6, 1933, by Silvestre Aviles [Hood No. 1037].

This species is closely related both to *H. flavicornis* and *H. fimbriatus*. From them it differs in the much more closely pubescent abdomen and the differently colored antennæ. The fringing abdominal plates are about as in *flavicornis*, except that the delicate spines at their ends are longer and much more evenly spaced. *H. flavicornis* has the third antennal segment distinctly longer in relation to its width, and the distance from the base of this segment to the third incision about 0.54, instead of 0.75, the length of segment four.

Heterothrips fimbriatus, sp. nov.

Female (macropterous).—Length about 0.9 mm. Color brown, abdomen paler than rest of body, thorax and abdomen with orange-colored subhypodermal pigmentation; ocellar pigmentation red; femora blackish brown, the fore pair yellow apically, the middle and hind pairs yellow at base only; fore tibiæ pale yellow, with a distinct brown cloud in basal half; middle tibiæ blackish brown, distal third pale yellow, proximal fourth yellowish and somewhat shaded with brown; hind tibiæ colored much like middle tibiæ but more extensively yellow at base; all tarsi pale yellow, with dark brown tarsal cups; fore wings gray, with a clear white subbasal cross-band; antennæ largely yellow in segments I-VI, uniform gray in VII-IX, segment I shaded very lightly with brown at base, II-IV with yellow internal pigmentation, IV shaded with brown at apex, more darkly on the inner surface, V and VI grayish yellow in middle portion, the sides, bases, and apices lightly shaded with gray.

Head of normal form, but widest and angulate just behind eyes, cheeks nearly straight and converging to base; *ocellar area and eyes at posterior margins delimited by a dark chitinous line* which marks the anterior margin of a distinct transverse occipital groove, behind which are about four dark anastomosing lines; *frontal costa with the emargination large and U-shaped*. *Eyes* of normal form and structure, almost as wide as their interval. *Ocelli* of posterior pair about twice the diameter of anterior ocellus and 0.56 as wide as their interval. *Antennæ* about 2.17 times as long as median length of pronotum, of normal form and structure; *segment III about 2.6 times as long as greatest width, its length from base to third incision about three-fourths the length of segment IV; IV only 0.57 as long as III, its sides arcuate*.

Prothorax about 0.8 as long as greatest width of head and about 1.72 times as wide as median length, broader posteriorly, with sides and posterior margin broadly rounded and anterior margin nearly straight; notum with a few short dark setæ and the usual longer ones at anterior and posterior angles, those along posterior margin about equal in length to those on disk but stouter; *anastomosing lines of sculpture distinct along posterior margin, very inconspicuous elsewhere*. Mesonotum only moderately closely striate. *Wings* of fore pair with about 27 setæ on costal margin, 22 on anterior vein, and 17 on posterior vein.

Abdomen stout (as is usual in the genus); *pubescence very sparse*, almost wholly lacking on tergum II; *posterior margins of terga I–VII fringed at sides with chitinous plates* whose distal ends are prolonged as usual into flat acute spines, these spines *moderately long on the mesad pair of plates, much shorter on the others*; tergum I broadly bare across middle portion of posterior margin, II with two minute median spines, III–V each with 6, VI–VIII with the comb *continuous and unbroken*.

Measurements of holotype (♀): Length 0.90 mm.; head, greatest width 0.147 mm., least width (at base) 0.135 mm., width across eyes 0.142 mm.; eyes, width 0.047 mm., interval 0.048 mm.; prothorax, median length of pronotum 0.115 mm., width 0.198 mm.; pterothorax, greatest width 0.242 mm.; abdomen, greatest width 0.232 mm.

Antennal segments:	1	2	3	4	5	6	7	8	9
Length (μ):	22	32	70	41	20	19	15	13	17
Width (μ):	28	27	27	27	17	15	10	9	6
Total length of antenna 0.249 mm.									

Described from one female taken by the author on Barro Colorado Island, Canal Zone, July 29, 1933, in flight [Hood No. 1016].

From the other members of the genus which have the abdominal terga fringed at the sides posteriorly with plates rather than simple spines, and whose hind tibiæ are yellow in the basal third, this species may be known by the shorter third antennal segment (70 μ long in the present species, more than 80 μ long in *arisemæ* and *moreirai*), the darker fourth antennal segment (uniform bright yellow in *flavicornis*), the much longer spines arising from the mesad pair of plates on the terga of the abdomen (these teeth minute in *flavicornis* and *pubescens*), and the sparse abdominal pubescence (the pubescence abundant in *pubescens*).

Corynothrips cruentatus, sp. nov.

Female (macropterous).—Length about 1.3 mm. (distended, 1.4 mm.). General color lemon yellow, with much crimson subhypodermal pigmentation; head and prothorax dark gray, with a dense and nearly continuous underlying layer of crimson which extends *posteriorly to occupy a little more than the anterior third of the metanotal plate*; sides of mesothorax, remainder of metathorax, all of abdominal segments I and II, and extreme sides of III–VII, bright yellow, the sides of VII shading to bright orange posteriorly; *in segments III–X of the abdomen the dense crimson pigmentation reappears, and forms in each of III–VII a large median blotch which occupies most of the dorsum of the segment*, these blotches smaller in IV and V and rounded posteriorly, the integument above at least the more posterior ones darkened somewhat with gray; VIII–X dark gray, with the crimson pigmentation restricted in VIII to about the posterior three-fifths of the segment, in IX to a thin broken median patch, and in X to a dense area occupying about the caudal three-fifths of the segment; ovipositor narrowly margined with crimson; legs, including all coxæ, pale whitish yellow, with traces of orange pigmentation at ends of tibiæ and a small nearly black spot in each tarsus; *fore wings gray in proximal eighth* (the anal area or “scale” darker) *and in distal three-fifths, the veins in these areas bright crimson*, the wing in the intervening portion of its length clear white; hind wings with a nearly black median vein extending almost to tip, in front of this vein white save for a gray spot at the base of each wing seta, behind the vein gray in distal three-fifths, base of wing with some crimson pigmentation along veins; antennal segments I and II blackish brown and with much crimson pigmentation; III blackish brown basally (save for a narrow colorless band at proximal ninth), paling to light gray distally, narrowly darker along sides and at tip, with abundant crimson pigmentation in all except distal eighth; IV gray in pedicel, darker gray in distal third, with a nearly black line around tip, the intervening portion white; V similar in color to IV, but with the pedicel darker; VI very narrowly gray at extreme base, almost white beyond, shading to pale gray in distal two-fifths; VII–IX pale gray, IX palest.

Head formed as in genotype, about 1.08 times as long as greatest width, which is across eyes, and 1.22 times as long as the width just behind eyes, the cheeks slightly diverging to base and with a slight swelling at middle; cephalic process (measuring from anterior margin of eyes) scarcely 0.23 as long as head, its least width about 1.4 times its length, sides concave; surface of head smooth, save for a few dark anastomosing lines across occiput; *interocellar setæ short, only 76 μ in length, nearly black*, arising from distinct tubercles, slightly fringed distally; vertex with a short seta on either side of anterior ocellus about midway between the latter and the eyes, two pairs of setæ near inner posterior margins of eyes, and two pairs, one directly below the other, on cheeks just behind eyes. *Eyes* normal to the genus, i. e., strongly protruding, pilose, and composed of circular facets which on the dorsal surface are separated by dark gray integument, the facets on the lower surface larger and contiguous. *Ocelli* rather close together, about 17 μ in diameter, the interval between posterior pair about

25 μ , median ocellus directed forward and upward but scarcely overhanging. *Antennæ* as in the genotype. *Mouth-cone* nearly attaining posterior margin of prosternum, normal in structure.

Prothorax nearly 0.9 as long as head and 1.27 times as wide as long, surface smooth, with three pairs of long setæ which are fringed distally, and nearly black in color, those near anterior angles 69 μ , epimerals 83 μ , posterior marginals 60 μ ; pronotum apparently with only four pairs of additional setæ, all of them short and pale, one situated on sides near anterior angles, one on sides above outer end of pleural suture, one on the line between posterior marginal setæ, and one (slightly farther apart than the last mentioned) between and behind the large pair near anterior angles, all of them very difficult to see because of the very dense prothoracic pigmentation. *Mesothorax* about 1.4 times as wide as prothorax, distinctly wider than metathorax, surface nearly or quite smooth. *Wings* as in genotype, i. e., very narrow and sabre-shaped, the fore pair with the anterior vein fusing with ambient just beyond the anal area, and with the posterior vein represented briefly at middle of wing but partly fused with ambient and anterior vein at or near either end, these fusions without doubt representing cross-veins; two rows of large heavy setæ, most of them similar in structure to interocellars and pronotals, borne by the fused veins, one row (of nine) inclined cephalad and the other (of eight) caudad, in addition to a similar seta arising from the end of the anal vein. Legs very long and slender, as in the genotype.

Abdomen long and slender, not much broader than prothorax, with all setæ short, excepting on segments IX and X, the former segment having two pairs and the latter having one pair of long grayish yellow setæ which are curved, fringed distally, and about 110 μ in length.

Measurements of holotype (φ): Length about 1.29 mm. (distended, 1.40 mm.); head, length 0.154 mm., greatest width (across eyes) 0.143 mm., least width (behind eyes) 0.126 mm., width near base 0.132 mm., length in front of eyes 0.045 mm., least width of this prolonged portion 0.064 mm.; eyes, length 0.066 mm.; prothorax, median length of pronotum 0.135 mm., width 0.171 mm.; pterothorax, greatest width 0.242 mm.; abdomen, greatest width 0.183 mm.

Antennal segments:	1	2	3	4	5	6	7	8	9
Length (μ):	27	45	93	85	67	44	17	13	16
Width (μ):	28	30	21	18	17	14	9	6	4
Total length of antenna 0.407 mm.									

Described from one female taken July 29, 1933, by Señorita Carmen Paredes A., on the lower surface of a banana leaf, Barro Colorado Island, Canal Zone [Hood No. 1017].

The italicized portions of the above description should serve to distinguish this species from the closely allied genotype.

Eurythrips conjunctus, sp. nov.

Female, forma macroptera.—Length about 1.4 mm. (distended, 1.79 mm.). Color of head bright yellow, slightly shaded with gray along cheeks and in

the region of the ocelli, thorax yellowish brown, the pterothorax darker along sides and in anterior portion of metanotum, where it is about concolorous with the base of abdomen, the latter shading to nearly blackish brown in last four or five segments, tube paler apically and more narrowly so at base; legs yellow, the middle and hind pairs slightly shaded with brown in femora and tibiae along outer surface and at base; wings grayish brown, the fore pair darker at base, at tip, along middle of distal half, and in the second fourth behind a narrow pale median line, nearly clear in an irregular area along posterior margin beyond the second subbasal seta; antennae concolorous with head in basal portion of segment I, shading to light brown distally, II largely brown but yellow or yellowish brown distally at middle, III-VIII nearly blackish brown save only the yellow pedicel of III and sometimes the brown middle portion of the distal three-fifths of III and IV; subhypodermal pigmentation bright red, distributed in ocellar region of head, in thorax, and in the first nine abdominal segments; ocellar pigmentation red.

Head nearly 1.4 times as long as greatest width, which is at base or at proximal third of cheeks, the latter nearly evenly but decidedly rounded to eyes and very slightly converging in basal third, with a slightly wider basal collar, serrate as seen from above because of short anastomosing lines which do not extend onto dorsum of head excepting faintly at extreme base; head sharply constricted at posterior margin of eyes, at this point narrowest and about 0.85 the least subbasal width, the width across eyes nearly equal to greatest width; vertex slightly elevated, sloping abruptly downward in front but scarcely overhanging, bearing the median ocellus at its extremity, distinctly subreticulate, and with two pairs of small setae about $16\ \mu$ long, one of them behind posterior ocelli, the other about midway between posterior ocelli and anterior ocellus; cheeks with about four pairs of similar small setae in addition to a pair behind and between postocular setae; postoculars pale yellowish, expanded at tip, $67\ \mu$ long and $90\ \mu$ apart. *Eyes* strongly protruding, composed of relatively few large convex facets, about 0.3 as long as head, their width about 0.8 their interval and about 0.77 their length. *Ocelli* present, posterior ones about $17\ \mu$ in diameter and about 0.63 as wide as their interval, *median ocellus with posterior margin about on line with anterior margin of eyes.* *Antennae* about 2.1 times as long as head, *segments VI-VIII rather compactly united because of the very short and broad pedicels of VII and VIII which are retracted into the apices of the preceding segments, VII with pedicel about $16\ \mu$ wide and twice as broad as that of VI, VIII with pedicel $13\ \mu$ wide;* segments III-V roughened with faint lines of sculpture; sense-cones slender, the number on inner (and outer) surfaces of segments as follows: III 1 (2), IV 1 (2), V 1 (1^{+1}), VI 1 (1^{+1}) VII with the usual one on dorsum near apex; setae long, slender, pale, and pointed. *Mouth-cone* broadly rounded at tip, surpassing middle of prosternum.

Prothorax along median line of pronotum about two-thirds as long as head and (inclusive of coxae) about twice as wide as long, with a very short vestigial median thickening, with a few faint lines of sculpture along posterior margin, and fused with posterior half or more of epimera; anterior

marginal setæ minute, the others long, yellow, and dilated at tip, the anterior laterals 68μ , midlaterals 60μ , epimerals $68-70 \mu$, posterior marginals 77μ , coxals 42μ . Pterothorax distinctly wider than prothorax, notal plates nearly smooth. *Legs* normal; fore tarsus with a slight downwardly-directed tooth or claw at inner distal angle of first segment. *Wings* normal, the fore pair without accessory setæ and with the three subbasal setæ long, knobbed, yellowish, and comparable with postoculars.

Abdomen about 1.33 times as wide as prothorax across coxæ, free of sculpture save for the usual dark transverse line near bases of terga II-IX and a few faint anastomosing lines at base of IX, major setæ mostly knobbed, the lateral pair on VII about 102μ and nearly pointed, its homologue on VIII about 83μ and knobbed, that on IX about 113μ and nearly pointed; tube about two-thirds as long as head and only 1.7 times as long as greatest subbasal width, this twice the apical width, sides very slightly concave in distal five-sixths, its terminal setæ light brown and about three-fourths its length.

Measurements of holotype (φ): Length about 1.37 mm. (distended, 1.79 mm.); head, length 0.184 mm., greatest width (at basal fourth and at base) 0.132 mm., width across eyes 0.130 mm., width at posterior margin of eyes 0.110 mm., least subbasal width 0.130 mm.; eyes, length 0.053 mm., width 0.041 mm., interval 0.050 mm.; prothorax, median length of pronotum 0.122 mm., width (inclusive of coxæ) 0.253 mm.; pterothorax, greatest width 0.301 mm.; abdomen, greatest width (at segment IV) 0.337 mm.; tube, length 0.122 mm., width near base 0.072 mm., at apex 0.035 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	40	50	60	58	54	52	41	32
Width (μ):	40	30	28	28	25	26	22	13
Total length of antenna 0.387 mm.								

Female, forma brachyptera.—Color much as in macropterous form but paler, the head with cheeks and ocellar region not shaded with gray, the thorax brownish yellow, the legs uniform bright yellow, the antennæ with segments I and II nearly concolorous with head and only lightly shaded with brown along sides and in pedicel of II. Structure as in macropterous form, excepting as follows: Head about 1.32 times as long as wide; ocelli wanting; eyes smaller, hardly 0.3 as long as head. Prothorax longer, about 0.77 as long as head, less than twice as wide as long. Wings short, elliptical, but the three subbasal setæ not reduced in size. Abdomen about 1.4 times as wide as prothorax across coxæ; setæ shorter, the nearly pointed lateral pair on VII about 93μ , the corresponding pair on VIII about 80μ and knobbed, that on IX slightly dilated and 103μ ; tube about 0.6 as long as head and about 1.57 times as long as greatest subbasal width, this more than twice the apical width.

Male (brachypterous).—Length about 1 mm. (distended, 1.31 mm.). Color exactly as in brachypterous female. Head 1.24 times as long as greatest width; postocular setæ 60μ long and 77μ apart. Eyes nearly 0.36 as long as head. Ocelli wanting. Antennæ nearly 2.3 times as long as head, the last three segments compactly united as in female, the pedicels of

VII and VIII respectively $15\ \mu$ and $13\ \mu$ broad at base. Prothorax along median line of pronotum about three-fourths as long as head and nearly twice as wide across coxæ as long; major setæ as in female but shorter, anterior laterals $57\ \mu$, midlaterals $58\ \mu$, epimerals $57\ \mu$, posterior marginals $63\ \mu$, coxals $37\ \mu$. Fore tarsus as in female. Abdomen about 1.27 times as wide as prothorax across coxæ; lateral setæ on segment VII swollen at tip and $78\ \mu$ long, homologous pair on IX similar and $65\ \mu$ long, longest pair on IX pointed, $105\ \mu$; tube about 0.6 as long as head and only 1.5 times as long as greatest subbasal width, this just twice the apical width, its terminal setæ about 0.83 its length.

Measurements of allotype (σ^7): Length 1.05 mm. (distended, 1.31 mm.); head, length 0.150 mm., greatest width (at base and at basal third) 0.121 mm., width across eyes 0.111 mm., width at posterior margin of eyes 0.099 mm., least subbasal width 0.117 mm.; eyes, length 0.042 mm., width 0.030 mm., interval 0.050 mm.; prothorax, median length of pronotum 0.110 mm., width (inclusive of coxæ) 0.215 mm.; pterothorax, greatest width 0.205 mm.; abdomen, greatest width (at segment II) 0.274 mm.; tube, length 0.093 mm., width near base 0.062 mm., at apex 0.031 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	37	44	51	50	48	46	38	28
Width (μ):	37	27	28	27	24	24	21	13
Total length of antenna 0.342 mm.								

Described from 2 macropterous females, 3 brachypterous females, and 8 brachypterous males, all taken under dead grass and fallen leaves on Barro Colorado Island, Canal Zone, Panamá, June 26, 1933, by Miss Sabra J. Hook and the writer.

This species is very closely related to *E. ampliventralis* Hinds, the type of the genus. Aside from the more darkly colored third antennal segment, it differs particularly in the form of the sixth antennal segment. In *ampliventralis* this segment is about $42\ \mu$ long and $23\ \mu$ wide, with a distinct nearly parallel-sided pedicel which is not more than $12\ \mu$ wide; in *conjunctus* the segment is about $52\ \mu$ long and $26\ \mu$ wide, and the pedicel flares widely at the base, where it is $16\ \mu$ wide. These differences are thoroughly constant in the material which I have seen.

***Trichothrips moultoni*, sp. nov.**

Female (macropterous).—Length about 1.6 mm. (distended, 2.1 mm.). Color brown, darker in head, paler in pterothorax and abdominal segment I, becoming nearly yellow in distal portion of abdomen, segments III–VII of the latter with an indistinct gray band along the subbasal transverse line of sculpture and another band, more distinct, along posterior margin, VIII and IX without the subbasal band but with the posterior one darker, especially in IX, the tube bright yellow in basal three-fifths, thence yellowish gray and narrowly tipped with darker gray; legs (excepting the dark brown fore coxæ) much paler than body, all tibiæ and tarsi clear lemon yellow (save for the dark brown tarsal cups), all femora shading to yellow at apex; fore wings brownish, darkest in scale; antennæ with segments I

and II paler than the others, I pale yellowish basally, darkest along sides, and with the remainder light brown, II light brown, darkest along sides, and yellow medially in distal portion, III with pedicel yellow and shading rapidly to nearly blackish brown, IV–VIII blackish brown; subhypodermal pigmentation bright red, scant, distributed in head, thorax, and along sides of abdomen; ocellar pigmentation darker red.

Head about 1.14 times as long as wide, broadest just behind eyes, the cheeks very nearly straight and converging to base, which is 0.9 the post-ocular width; dorsal surface, as seen from the side, arched and swollen in occipital region; vertex distinctly overhanging, bearing the large (27 μ) median ocellus at its extremity, with two pairs of short curved setæ on sides and a straighter pair behind posterior ocelli, its surface minutely subreticulate; at sides with faint dark anastomosing lines (which become more distinct posteriorly, where they are diagonal in direction and extend closer to median line), and with about ten pairs of slender pale setæ in addition to a longer pair (33 μ) situated 28 μ behind postoculars and 69 μ apart; postocular setæ not expanded at tip, blunt, 92 μ long and 132 μ apart. *Eyes* of medium size, about 0.3 as long as head and 0.8 as wide as their interval. *Ocelli* large, 27 μ in diameter, the median one with its posterior margin on a line with front margin of eyes, the posterior ocelli of slightly greater diameter than their interval and with posterior margins on a line with middle of dorsal aspect of eyes. *Antennæ* about 2.25 times as long as head, eighth segment fusiform and pedicellate; sense-cones on inner (outer) surfaces as follows: III 1 (2), IV 1 (2), V 1 (1+), VI 1 (1+), VII with the usual one on dorsum near apex; all setæ long and pointed. *Mouth-cone* large, rounded at tip, extending nearly across prosternum.

Prothorax along median dorsal line about 0.7 as long as head (inclusive of coxæ) about 2.35 times as wide as long, without median thickening, posterior margin with a few faint anastomosing lines of sculpture, epimeron not fused with pronotum; major setæ all present, yellow, very slightly expanded at tip, long, the anterior marginals 65 μ , anterior laterals 67 μ , midlaterals 102 μ , epimerals 123 μ , posterior marginals 120 μ , coxals 81 μ . *Legs* normal; fore tarsus with a minute tooth at middle. *Wings* apparently normal (distal portion wanting in the dealated holotype); subbasal setæ three in number, slightly expanded distally, the longest about 90 μ . *Pterothorax* distinctly wider than prothorax across coxæ.

Abdomen of normal form and structure, broadest at segment III, where it is distinctly wider than pterothorax, free of sculpture excepting for the usual transverse subbasal line across terga II–VIII and slight anastomosing lines at sides and on proximal portion of tergum IX; tube about two-thirds as long as head and nearly 1.7 times as long as greatest subbasal width, the last scarcely twice the distal width, sides nearly straight beyond the basal shoulder; setæ long, slender, all pointed excepting the dorsal pair on VIII which is slightly expanded distally and 93 μ long, all yellow excepting the wing-retaining ones and those at tip of tube, these being brown; VII with lateral setæ 167 μ , VIII with these 130 μ , IX with lateral and dorsal setæ subequal and 173–177 μ , longest terminal setæ 187 μ .

Measurements of holotype (♀): Length about 1.60 mm. (distended,

2.11 mm.); head, length 0.202 mm., greatest width (just behind eyes) 0.177 mm., least width (near base) 0.159 mm.; eyes, length 0.060 mm., width 0.052 mm., interval 0.065 mm.; prothorax, median length of pronotum, 0.141 mm., width (inclusive of coxæ) 0.332 mm.; pterothorax, width, 0.374 mm.; abdomen, greatest width (at segment III) 0.402 mm.; tube length 0.137 mm., width near base 0.081 mm., width at apex 0.043 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	43	57	65	63	63	57	53	53
Width (μ):	46	34	35	35	33	28	24	17
Total length of antenna 0.454 mm.								

Described from one macropterous dealated female taken by the author from a dead branch of a tree at Porto Bello, Panamá, July 10, 1933 [Hood No. 988].

Readily known from *angusticeps*, *occipitalis*, and *medi americanus* by the much longer setæ, most of which are pointed.

Diceratothrips princeps, sp. nov.

Male (macropterous).—Length about 4.5 mm. (distended, 5.2 mm.). Color nearly uniform dark blackish brown (shining black to the naked eye or under low magnifications), with knees, tarsi, and distal portion of segment II of antennæ slightly paler.

Head just less than twice as long as width at middle, decidedly broadest across basal collar, wider across eyes than at middle, the cheeks broadly and evenly concave, each with about four strong, dark setæ ($50-70 \mu \times 7 \mu$) projecting beyond its outline, in addition to a much shorter and weaker seta almost directly below the large anterior one, none of these setæ arising from protuberances; dorsal surface nearly free of sculpture, with two pairs of small setæ on a transverse line about midway between postocular setæ and base of head; vertex transverse, not prolonged, distinctly surpassed by eyes, with a strong, dark, nearly pointed seta measuring about 91μ on either side of the median ocellus; postocular setæ 224μ , pointed, dark in color. *Eyes* about 0.23 as long as head and 0.72 as wide as their interval, on ventral surface of head as wide as on dorsal surface but only four-fifths as long. *Ocelli* of posterior pair 32μ in diameter, situated slightly behind middle of eyes, and about 0.44 as wide as their interval, with a minute seta behind inner margins; median ocellus directed forward and upward. *Mouth-cone* heavy, labium broadly rounded and surpassed by labrum, the tip of the latter beyond middle of prosternum; maxillary palpi with segment I about $42 \mu \times 25 \mu$ and segment II about $91 \mu \times 19 \mu$. *Antennæ* almost twice as long as head, of normal form and structure, segment IV slightly, V and VI distinctly, prolonged ventrally at apex, VIII conical and broadly joined with VII; III 2.8 as long as II and 1.38 times as long as IV; sensecones short (about 20μ); segment III with one on outer surface, and one on ventral surface at apex of a slight tubercle; IV with one inner, two outer, and one ventral (at apex of the slight prolongation); V with one inner and one outer; VI with one inner and one more slender dorsal; VII with the

usual dorsal trichome at apex; setæ short, pointed, the longest on III about 47 μ ; length (width) of segments in microns, I 83 (68), II 107 (52), III 305 (58), IV 221 (57), V 180 (48), VI 135 (40), VII 102 (33), VIII 57 (21).

Prothorax across coxæ about 1.68 times the median length of pronotum, the latter about 0.85 the length of head, broadly rounded posteriorly, with concave anterior margin, most of its surface delicately and minutely reticulate, and with a distinct median thickening; epimeron not fused with pronotum; anterior marginal, anterior lateral, and midlateral setæ minute, epimeral 210 μ , posterior marginal 168 μ (sometimes much shorter), both dark brown basally, coxal 70 μ . *Fore femora* very large (924 μ x 437 μ), broadened near base on inner surface, the latter decidedly concave at middle of femur, *dorsal* surface near base with a varying number of short, very stout, dark setæ which do not extend beyond outline of femur as seen from above; fore tibæ with a row of distinct setigerous tubercles on inner surface; fore tarsus with a nearly straight tooth 145 μ long; middle and hind tibæ (the latter 655 μ long) on outer surface with two long pale setæ, the one at basal two-fifths about 308 μ long, the distal one shorter. *Wings* of fore pair typical in form, with about 47 accessory setæ on posterior margin; subbasal setæ brown, the outermost scarcely pointed and longest (157 μ).

Abdomen of normal form and structure, little more than 0.8 as wide across segment II as prothorax across coxæ; setæ dark brown, with pale distal ends, mostly pointed, those at apex of segment IX longest, 585 μ ; tube slightly longer than head, about 3.5 times as long as basal width, and about 2.6 times as wide at base as at apex, narrowed (but not constricted) at apex and slightly narrowed at basal sixth, so that the sides are just perceptibly sinuate; terminal setæ dark, 238 μ .

Measurements of male (holotype).—Length 4.54 mm. (distended, 5.18 mm.); head, length 0.602 mm., greatest width (at basal collar) 0.354 mm., least width (at middle) 0.277 mm., width across eyes 0.308 mm.; eyes, length 0.140 mm., width 0.091 mm., interval 0.126 mm.; prothorax, length of pronotum 0.511, width (including coxæ) 0.860 mm.; pterothorax, greatest width 0.812 mm.; abdomen, greatest width 0.699 mm.; tube, length 0.612 mm., width near base 0.175 mm., at apex 0.067 mm.; antennæ, length 1.19 mm.

Female (macropterous).—Length about 4.5 mm. (distended, 5.7 mm.). Color nearly uniform dark blackish brown, as in male.

Head about 1.53 times as long as width at middle, broadest across basal collar, narrower across eyes than at middle, the cheeks slightly converging to eyes and to basal collar, with the middle portion straight and parallel; setæ on cheeks as in male but shorter and more slender, the pair on lateral margins behind eyes largest, 50 μ x 7 μ ; vertex not surpassed by eyes, transverse and nearly vertical, but with the median ocellus directed upward as well as forward and not overhanging; frontal setæ 119 μ , longer than in male. *Eyes* nearly 0.25 as long as head, scarcely 0.7 as wide as their interval. *Ocelli* of posterior pair 33 μ in diameter, almost opposite middle of eyes and about 0.41 as wide as their interval. *Antennæ* about 2.1 times as long as head, formed as in male; length (width) of segments in microns, I 83 (67),

II 113 (52), III 280 (58), IV 207 (58), V 170 (50), VI 133 (44), VII 110 (37), VIII 47 (22).

Prothorax across coxæ about 2.46 times the median length of pronotum, the latter only 0.6 the length of head, much less rounded than in male and without median thickening, but with delicate and minute reticulation; epimeron not fused with pronotum; epimeral seta $238\ \mu$ in allotype, posterior marginal and coxal setæ $70\ \mu$. *Fore femora* of normal form and size, with a few short but not particularly stout setæ on inner and dorsal surface near base; fore tibiæ with a row of setæ on inner surface, but the slight irregularities from which they arise are scarcely tubercles; fore tarsal tooth arising from inner distal angle of first tarsal segment, very short, rounded, and directed somewhat downwardly; middle and hind tibiæ (the latter $728\ \mu$ long in allotype) with setæ on outer surface as in male, but longer, the one at basal two-fifths of hind tibiæ often $360\ \mu$ long. *Wings* about as in male.

Abdomen broader than in male, 1.1 times as wide across segment II as prothorax across coxæ; setæ longer than in male, those at apex of IX often $700\ \mu$; tube about 1.2 times as long as head, about 3.7 times as long as basal width, and about 2.5 times as wide at base as at apex, less narrowed near base than that of male.

Measurements of female (allotype).—Length 4.49 mm. (distended, 5.73 mm.); head, length 0.539 mm., greatest width (at basal collar) 0.368 mm., width at middle 0.353 mm., width across eyes 0.330 mm.; eyes, length 0.133 mm., width 0.095 mm., interval 0.139 mm.; prothorax, median length of pronotum 0.322 mm., width (including coxæ) 0.791 mm.; pterothorax, greatest width 0.882 mm.; abdomen, greatest width 0.876 mm.; tube, length 0.651 mm., width near base 0.176 mm., at apex 0.070 mm.; terminal setæ 0.266 mm.

Described from 4 males and 28 females, taken by the writer from dead branches of various trees at Barro Colorado Island, Canal Zone (type locality), and Porto Bello, Panamá, July 4–10, 1933 [Hood Nos. 971, 973, 984, and 988].

This species, apparently the largest of the genus, I have in vain endeavored to reconcile with the allied *D. armatus* Bagnall, *D. robustus* (Schmutz), *D. persimilis* Priesner, and *D. bicornis* Bagnall. The first of these (*armatus*, from Venezuela) differs in having the fore femora armed in both sexes with stout, tooth-like setæ on the inner surface, the head (particularly that of the female) narrowed posteriorly, and the pronotum of the female three-fourths the length of the head. The second (*robustus*, from Brazil), even after making full allowance for obvious inaccuracies in drawing, would appear to be a very different insect because of the numerous, closely-placed, and very stout, nearly triangular, tooth-like setæ on the inner surface of the slenderer fore femora at base, and the obviously longer frontal setæ (Schmutz illustrates each of these structures in two separate figures). The third (*persimilis*, from Surinam), though described in this genus, is said to lack the ventral prolongations found on the lower surface of the apex of the intermediate antennal segments, to be without accessory setæ on the posterior margin of the fore wings (both of them generic charac-

ters), and to have three sense-cones only (instead of the usual four) on the fourth antennal segment; but even if we dismiss these striking differences as possible misobservations, *princeps* may nevertheless be distinguished by the much longer fore femora (in the female 532 μ vs. 467 μ) and posterior tibiae (728 μ vs. 623 μ). The fourth and last species (*bicornis*, probably from Brazil) is said to have the eyes half as wide as their interval (0.7 in *princeps*), the third antennal segment 1.2 times as long as the fourth (1.35–1.38 in *princeps*), the tube 1.33 times as long as head (1.0–1.2 in *princeps*), and the mesothorax 0.7 mm. wide (0.88–0.94 in *princeps*).

In common with the other species of *Diceratothrips* which I have observed alive, this has the habit when disturbed of curling the abdomen upward and forward over the thorax, so that when seen from above it looks like a small black shining beetle. It was common at Barro Colorado Island on a dead branch of pomarosa (*Eugenia jambos* L.) which had been cut a week or more previously. It feeds on fungus spores and is viviparous.

Karyothrips ochropezus, sp. nov.

Female, forma macroptera.—Length about 1.4 mm. (distended, about 1.8 mm.). Color brown or blackish brown, darker in head and distal portion of abdomen, with all legs clear bright yellow beyond coxæ (excepting only that the fore femora are infrequently lightly clouded with brown on outer surface at base), all coxæ brown, fore pair darkest; antennæ with segment I about concolorous with head but paler across base, II black in pedicel and narrowly blackish brown along all of inner surface and basal half of outer, the remainder of segment brownish or yellowish and paler outwardly at apex, III pale yellow, often brighter in pedicel, with a narrow edging of black on outer surface at apex and along inner surface, a blackish cloud extending from the latter across the segment just beyond pedicel, IV darker and more brownish than III, darker along inner surface and nearly black in at least the outer portion of pedicel, V–VIII nearly uniform blackish brown; subhypodermal pigmentation bright red, usually a patch in ocellar region of head, a band extending around margin of dorsum of prothorax, a patch on ventral surface of prothorax occupying the membranous areas, a broken strip across front of mesothorax, and a line along each side of pterothorax and the first nine segments only of abdomen, this line broadest (or doubled) in pterothorax; wings clear and easily overlooked, fore pair with anal area ("scale") brown.

Head very long but quite variable, in the holotype 1.77 times as long as greatest width (in the other specimens this proportion is 1.57, 1.73 and 1.76), the actual length varying from 165 μ to 200 μ and the width from 103 μ to 113 μ , broadest at about middle, the cheeks very nearly parallel but somewhat converging to eyes and narrowed to a very slight neck which is about 0.9 the greatest width; surface shining and entirely free of sculpture save only for the usual transverse subbasal line, vertex evenly declivous, not at all produced or overhanging, with a pair of very minute setæ just laterad of median ocellus and a similar pair on a line with outer margin of posterior ocelli and midway between them and the usual vertical pore;

a third pair of slightly longer setæ directly behind posterior ocelli, a fourth pair behind postocular setæ and as far apart as their distance from the latter, cheeks with a few similar minute pale setæ; postoculars about 35μ , pale brownish, slender, and broadly knobbed; ocelli 9–11 μ in diameter, the interval between the posterior pair nearly three times their diameter, the median ocellus directed nearly upward, its posterior margin slightly behind line of front margin of eyes. *Eyes* about 0.3 as long as head and about 0.65 as wide as their interval, evenly rounded with curve of head and not at all protruding. *Antennæ* about 1.6 times as long as head, segment VIII subconical and broadly articulated with VII; sense-cones slender and very inconspicuous, the number on inner (and outer) surfaces of segments as follows: III 0 (1), IV 1 (2), V 1 (1+), VI 1 (1+), VII with the usual one on dorsum near apex; setæ short, pale, and pointed. *Mouth-cone* short and broadly rounded, the tip of labrum not attaining tip of labium.

Prothorax along median line of pronotum about 0.62 as long as head and (inclusive of coxæ) about 1.7 times as wide as long, with a short median thickening at middle; surface free of sculpture and shining; anterior marginal setæ minute, a similar pair between them and anterior laterals, the others brownish, knobbed, and variable in length, holotype with anterior laterals 22 μ , midlaterals 19 μ , epimerals 47 μ , posterior marginals 35 μ , and coxals 30 μ . Pterothorax slightly narrower than prothorax. *Legs* moderately short, fore and hind femora somewhat swollen, fore tarsi with a downwardly projecting claw at inner distal angle of first segment. *Wings* slender and weak, scarcely narrowed at middle; fore pair with the three subbasal setæ knobbed (the distal one about 33 μ long), and with 2–3 accessory hairs on posterior margin.

Abdomen of normal form, distinctly broader than prothorax; tube half as long as head, 1.76 times as long as basal width, and twice as wide at base as at apex, sides straight; major setæ slender and pale yellowish, all knobbed, excepting the pointed lateral pair on VII (measuring 113 μ) and all on IX and XI, the dorsal pair on former 110 μ and the lateral pair 137 μ , the longest on XI about 100 μ and darker in color.

Measurements of holotype (♀): Length about 1.39 mm. (distended, 1.82 mm.); head, length 0.200 mm., greatest width 0.113 mm., width at base 0.101 mm.; eyes, length 0.059 mm., width 0.028 mm., interval 0.043 mm.; prothorax, median length of pronotum 0.123 mm., width (inclusive of coxæ) 0.213 mm.; pterothorax, greatest width 0.197 mm.; abdomen, greatest width 0.235 mm.; tube, length of segment X 0.097 mm., width at base 0.055 mm., width at apex 0.028 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	34	45	43	47	47	42	42	23
Width (μ):	33	27	25	27	26	23	20	12
Total length of antenna 0.323 mm.								

Female, forma brachyptera.—Identical with long-winged form in all details of color and structure, save only that the ocelli are sometimes much smaller (measuring only 5 μ , instead of 9–11 μ , in diameter) and that the

wings are reduced to pads which attain the middle of the first abdominal segment.

Male, forma macroptera.—Length about 1.05 mm. (distended, 1.27 mm.). Color and structure as in macropterous female.

Male, forma brachyptera.—Identical with long-winged form in all respects save wing development, or with the ocelli smaller.

Described from 6 females (2 brachypterous) and 10 males (8 brachypterous), from Frijoles (type locality) and Barro Colorado Island, both in the Canal Zone, taken under dead grass and leaves, June 30–July 23, 1933, by Sabra J. Hook, Helen H. Hood, James Zetek, José Villaneuva, and the author.

The coloration of the legs serves for its immediate recognition.

Eupathithrips spectator, sp. nov.

Female (macropterous).—Length about 4.1 mm. (distended, about 5.1 mm.). Color dark blackish brown, nearly or quite black to the naked eye, with five pairs of prominent lateral white spots (visible only by *reflected* light) on abdomen, the first pair involving sides of segment I and extending onto segment II, the remaining pairs occupying the anterior third or more of the sides of segments IV–VII and extending onto both dorsal and ventral surfaces; tube paler at apex than at base; femora blackish brown, the fore pair with tooth yellowish brown, the middle and hind pairs shading to yellowish-brown in trochanters; fore tibiae blackish brown at extreme base, bright lemon yellow beyond, middle and hind tibiae blackish brown in basal third and three-fifths, respectively, yellow beyond; all tarsi bright yellow with blackish brown cups; wings light brownish, darker at base, and with a nearly black median streak extending to near tip; antennae brown or blackish brown in segments I, II, VII, and VIII, the remaining segments largely or partly yellow, III–V successively more darkly and extensively clouded with dark brownish gray in the distal enlargement and in the constriction beyond, III more brightly yellow at extreme base than at middle, IV and V with basal third or more lightly overlain with gray, VI dark brown in more than distal half and brownish yellow basally; subhypodermal pigmentation of two colors, red and snow-white, the former appearing purplish through the dark portions of the integument, the latter situated beneath transparent portions of the integument and producing the ten white spots described above.

Head about 2.18 times as long as greatest width (measuring the latter from tip to tip of tubercles behind middle of cheeks), the width across eyes about 1.18 times the least width which is just behind eyes, the cheeks curving evenly to eyes and more abruptly to near base, in front of the basal collar almost exactly equal to width behind eyes, usually with 5 or 6 pairs of pointed setigerous tubercles (which measure 10–13 μ in length) forming a single row along exact side of each cheek, and with a dark pointed seta about 34 μ long arising from a low tubercle higher up on cheek a short distance behind eye, in addition to a number of small pale setae above the row of tubercles; postocular setae 67 μ , short, stout, dark in color, broad-

ened at apex, their interval about 128 μ ; dorsal surface of head subreticulate medially at base; vertex much reduced in size by the enlarged eyes, margined along edge of eyes by the usual dark curved setæ of which a postocellar pair (50 μ) is longest and less curved, the ocelli about 37 μ in diameter, the interval between the posterior pair 29 μ , that between median and posterior ocelli 34 μ . *Eyes* typical of the genus (i. e., reniform, greatly enlarged, strongly protruding, and finely faceted), three-eighths as long as head and about 1.57 times as wide as their interval across posterior ocelli, ventrally only slightly wider than their interval and about 0.79 as long as dorsally. *Antennæ* of normal form; lateral setæ at distal end of segments III and IV much less than half as long as sense-cones, knobbed (sense-cone on outer surface 167 μ , accompanying seta 70 μ); segment III averaging 0.94 as long as IV, the sense-cone on its outer surface much shorter than the segment itself; sense-cones on inner (and outer) surfaces of segments: III 1 (2), IV 1 (2), V 1 (1), VI 1 (1), VII 1 dorsal. *Mouth-cone* long, acute, extending beyond base of prosternum.

Prothorax along median dorsal line of pronotum about 0.45 as long as head and about 2.4 times as wide as long, with distinct black median thickening lying mostly in front of middle, epimeron and the raised posterior margin of pronotum with fine anastomosing lines, remainder smooth; all major setæ present, not stout, dark in color, and expanded at tip, the anterior marginals 72 μ , anterior laterals 67 μ , midlaterals 77 μ , epimerals 127 μ , posterior marginals 110 μ , coxals 67 μ . *Pterothorax* slightly wider than prothorax, of normal structure. *Legs* normal, fore femora and tibiæ both with low setigerous tubercles along inner surface, the fore femora with the usual distal tooth, the fore tarsi with a short downwardly-directed tooth at middle. *Wings* of the usual structure, with 40 or more accessory setæ and with the distal subbasal seta about 132 μ long.

Abdomen of normal structure, sculptured as in the other species of the genus; setæ mostly knobbed, lateral pair on VII 266 μ , on VIII 210 μ , on IX pointed and 322 μ ; *tube* 0.47 as long as head, 2.3 times as long as greatest subbasal width, and 2.3 times as broad near base as at apex, sides straight, terminal setæ 266 μ .

Measurements of paratype (φ): Length about 4.09 (distended, 5.14 mm.); head, length 0.672 mm., width across eyes 0.304 mm., width just behind eyes 0.258 mm., greatest width (at basal third including tubercles) 0.308 mm., same width exclusive of tubercles 0.288 mm., least subbasal width 0.259 mm.; eyes, length 0.252 mm., greatest width 0.143 mm., interval across posterior ocelli 0.091 mm.; prothorax, median length of pronotum 0.305 mm., width (inclusive of coxæ) 0.739 mm.; pterothorax, greatest width 0.749 mm.; abdomen greatest width (at segment III) 0.658 mm.; tube, length 0.316 mm., width near base 0.137 mm., at apex 0.060 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	100	87	237	250	253	142	103	56
Width (μ):	65	47	57	58	49	38	32	17
Total length of antenna 1.23 mm.								

Male (macropterous).—Length about 3.3 mm. (distended, 4.3 mm.). Color as in female. Head about 2.21 times as long as greatest width and 1.22 times as wide across eyes as least subbasal width; ocelli about $31\ \mu$ in diameter, interval between posterior pair $23\ \mu$, that between median and posterior ocelli $27\ \mu$; postocular setæ $73\ \mu$, their interval $105\ \mu$. Eyes three-eighths as long as head, 1.62 times as wide as their interval across posterior ocelli, ventrally 1.25 times as wide as their interval and about 0.87 as long as dorsally. *Antennæ* with segment III nearly as long as IV, the sense cone on its outer surface $140\ \mu$, much shorter than the segment itself, its accompanying seta $63\ \mu$. *Prothorax* proportioned as in female but with shorter setæ, the anterior marginals $47\ \mu$, anterior laterals $52\ \mu$, midlaterals $57\ \mu$, epimerals $93\ \mu$, posterior marginals $73\ \mu$, coxals $60\ \mu$. *Fore femora* and tibiæ with setigerous tubercles minute. *Wings* with fewer accessory setæ, usually about 35, the distal subbasal seta about $93\ \mu$. Abdomen more slender than in female; lateral setæ on VII $185\ \mu$, on VIII $162\ \mu$, on IX pointed and $235\ \mu$; tube about 0.45 as long as head, about 2.4 times as long as greatest subbasal width, and not quite twice as broad near base as at apex, terminal setæ $224\ \mu$.

Measurements of paratype (σ): Length about 3.33 mm. (distended, 4.27 mm.); head, length 0.574 mm., width across eyes 0.266 mm., width just behind eyes 0.221 mm., greatest width (at basal third and including tubercles) 0.259 mm., same width exclusive of tubercles 0.246 mm., least subbasal width 0.216 mm.; eyes, length 0.216 mm., greatest width 0.125 mm., interval across posterior ocelli 0.077 mm.; prothorax, median length of pronotum 0.241 mm., width (inclusive of coxæ) 0.580 mm.; pterothorax, greatest width 0.553 mm.; abdomen, greatest width (at segment II) 0.456 mm.; tube, length 0.269 mm., width near base 0.108 mm., at apex 0.057 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	80	77	200	205	202	107	97	51
Width (μ):	54	40	52	52	45	34	30	17
Total length of antenna 1.02 mm.								

Nymph, Instar II.—Color cream-yellow in mesothorax, abdominal segments I and II, extreme sides of IV, all of V excepting a spot of bright red at middle, and in lateral thirds of VII, the remainder of body bright red, excepting as the pigment is overlain with the dark blackish brown integument of head, prothorax (particularly anteriorly), posterior angles of abdominal segment VIII and all of IX and X; all femora and extreme bases of tibiæ blackish brown, the remainder of tibiæ nearly white, clouded with gray distally; segments I and II of antennæ dark blackish brown, excepting distal third of II which is abruptly nearly white; III pale whitish yellow, shaded with dark brown at extreme base and with gray brown in distal sixth; IV gray brown with a pale area just beyond base, darkest just before apex, at base, and along the transverse lines of sculpture; V similarly colored but darker; VI and VII nearly uniform dark gray-brown.

Structure, in general, normal to the genus; cephalic horns (morphologically these are setigerous tubercles) present in the usual position (much

as in *Acanthothrips nodicornis*); eyes small, composed of three (possibly four) facets, of which the most posterior is borne at the end of a slight lateral process from which a thumb-shaped chitinous projection about $13\ \mu$ long extends laterally; this portion of the eye is thus briefly stalked, with the facet carried beyond the side margin of the head and protected externally by the heavy thumb-like tubercle.

Described from 22 females, 30 males, and 3 nymphs taken by the author from dead branches of various species of trees and from molding fruit of the Corozo Palm (*Scheelea zonensis* Bailey, = *Attalea cohune* Seemann, = *A. gomphococca* of lists), on Barro Colorado Island, Canal Zone (type locality), and at Porto Bello, Panamá, June 25–August 9, 1933.

Very close to *E. silvestrii* (Buffa), the only other species of the genus with short lateral setæ on the third and fourth antennal segments external to the sense cones, but abundantly distinguished by the longer third segment of the antennæ, with its shorter sense-cones, and by the differently colored tibiae. The structure of the eye of the nymph is remarkable and unique.

Macrophthalthrips narcissus, sp. nov.

Female (macropterous).—Length about 1.7 mm. (distended, 2.0 mm.). Color brown, with intermingled red and opaque-white subhypodermal pigmentation: By *reflected* light and in freshly-mounted specimens which have not remained too long in preservative, with a prominent white latero-dorsal stripe extending from the eye to base of head and traversing the prothorax, where it is widened posteriorly; pterothorax with a pair of white spots at sides of mesonotum close to tegulae and another larger pair between metanotum and metaepimeron, in addition to more obscure spots at middle of mesonotum, at anterior angles of mesothorax, and just behind posterior wings at the base of the fused metathoracic epimeron and episternum, sometimes with the lateral surfaces largely white because of the extension and fusion of the above markings; abdomen with segment I and sides of I–VII largely white; red pigmentation prominent in thorax and darker portions of abdomen; eyes bright red. By *transmitted* light, and in specimens which have remained longer in preservative, these white markings are not evident as such but the nearly transparent areas of the cuticula through which the white pigmentation may normally be seen show as pale yellowish markings; the sides of the body, including the head but not the tube, are thus largely yellow save for the posterior part of mesothorax and of metathorax, and the broad median portion is dark brown; head, thorax, first two abdominal segments and the last four, with much bright red pigmentation; *abdomen darkest at base and much paler distally, often shading to nearly clear yellow both dorsally and ventrally in segments VI–IX and with the median brown blotch on these segments often reduced to a small transverse subbasal cloud; base of tube sometimes yellow; all coxæ blackish brown; middle and hind femora somewhat paler and tipped with yellowish, the hind pair paler also at base; fore femora pale yellowish white at either end, middle portion pale brownish and usually darker ventrally;*

fore tibiæ yellow, with an irregular blackish ring around middle; middle and hind tibiæ similarly ringed, the latter darker basally; tarsi yellow, with brown cups; wings brownish, with a dark median streak; antennæ with segment I brown in basal half and yellowish distally, II yellow, with a dark gray cloud occupying outer portion of distal half, III yellow in basal three-fifths and clouded with gray or brown beyond, IV and V with basal two-fifths, and VI with basal half, yellow, the remainder of antennæ dark gray or brown.

Head about 1.43 times as long as greatest width (which is near base) and about 1.73 times as long as width across eyes, the cheeks nearly parallel in posterior portion and curving to eyes anteriorly, where they are very minutely serrulate; vertex produced, overhanging, bearing the partially obscured median ocellus below its apex, with about four pairs of strong, brown, medially-curved setæ at sides in front of posterior ocelli and a nearly straight pair ($30\ \mu$) behind them, its rounded anterior portion with a number of raised longitudinal darker lines of sculpture, the portion behind the ocelli reticulate and with 4–6 slender setæ which are shorter than the postocellar pair; dorsal surface of head, in the dark median area (which is about equal in width to the distance across eyes), with transverse anastomosing lines of sculpture, *the reticles in median portion not occupied by minute wrinkles*, the pale vitta on each side of head free of sculpture; postocular setæ $36\ \mu$, dilated at apex, a minute pair of setæ between them equal to about a dozen scattered pairs in darkened area, and to several very inconspicuous ones in the pale vittæ and on profile of cheeks; one to three minute setæ in narrowest part between eyes. *Eyes* normal to the genus, i. e., very large, finely faceted, nearly touching dorsally (*not more than $2\ \mu$ apart*) and completely touching beneath vertex, reniform as seen from above. *Ocelli* of posterior pair with diameter about 0.86 their interval. *Antennæ* with all of segment I and more than half of II covered by eyes; *segments VII and VIII fused on dorsal surface*. Mouth-cone long and pointed but scarcely attaining metasternum.

Prothorax about 2.4 times as wide across coxæ as median length of pronotum, the last about 0.43 as long as head, with a deep transverse apodemal furrow very slightly behind middle, in front of which are two pairs of small round impressions, one directly in front of the other, at the inner margin of the white vitta; central dark area nearly quadrangular, *very closely transversely striate with very fine dark lines* which are closer together in the region behind the transverse furrow, the *interspaces usually completely devoid of sculpture*, though some occasionally with a single row of minute stipple-like dots; white vittæ marked off into polygonal reticles by faint sculpture; episternum, epimeron, and pronotum fused, no separating sutures visible; all usual setæ present, stout, pale, and dilated at tip. *Pterothorax* slightly narrower than prothorax; mesonotum transversely, metanotum longitudinally, striate with darker anastomosing lines between which the surface is minutely granulate and stippled in appearance. *Legs* short and slender, the fore femora only half as long as head, the middle tibiæ even shorter, fore tarsus unarmed. *Wings* of normal form; three subbasal

setæ almost clear, dilated at apex, about comparable with posterior marginals on pronotum; posterior margin of fore pair with 3-5 accessory hairs.

Abdomen long and slender, only 0.9 as wide as pterothorax; terga II-VII with a patch of minute spines laterad of the wing-retaining setæ, the spines arising from lines of sculpture, the patches smaller and the spines weaker on the posterior terga, those on VII just distinguishable; tube about 0.4 as long as head, about 1.9 times as long as greatest subbasal width which is slightly more than twice the apical width, sides straight; major abdominal setæ knobbed, excepting only the pointed lateral pair on VI, VII, and IX, which are respectively 79 μ , 111 μ , and 107 μ ; knobbed dorso-lateral setæ on VII measuring 100 μ , on VIII 74 μ , on IX 93 μ ; terminal setæ pointed, 100 μ .

Measurements of paratype (φ): Length about 1.67 mm. (distended 2.04 mm.; head, length 0.287 mm., greatest width 0.201 mm., width across eyes 0.166 mm.; eyes, length 0.157 mm., width 0.082 mm.; posterior ocelli, diameter 0.018 mm., interval 0.021 mm.; prothorax, median length of pronotum 0.123 mm., width (inclusive of coxæ) 0.313 mm.; pterothorax, greatest width 0.302 mm.; abdomen, greatest width 0.278 mm.; tube, dorsal length of segment 10, 0.117 mm., greatest subbasal width 0.062 mm., width at apex 0.030 mm. Setæ: anterior marginal 43 μ , anterior lateral 47 μ , midlateral 36 μ , epimeral 68 μ , posterior marginal 52 μ , coxal 39 μ .

Antennal segments:	1	2	3	4	5	6	7
(Length (μ):	33	50	70	66	57	56	71
Width (μ):	32	35	27	27	24	24	22
Total length of antenna 0.403 mm.							

Male (macropterous).—Color and structure (including sculpture) as in female. Size much smaller, the length averaging about 1.27 mm. (distended, about 1.53 mm.), the greatest width of pterothorax about 0.234 mm.

Described from 4 females and 7 males, all taken from dead branches at Porto Bello, Panamá (type locality), July 11, 1933, by the writer, and on Barro Colorado Island, Canal Zone, July 29, 1933, by James Zetek and the writer.

In his description of *M. hemipteroides*, the only species of the genus with which this may profitably be compared, Priesner makes no reference to the sculpture of the head and pronotum and does not describe the dorso-lateral vittæ as white; but in both of these respects I am sure that his species does not differ from the present one. However, his description and figure agree in ascribing eight instead of seven, segments to the antennæ; the latter are slenderer than in *narcissus* and composed of much longer segments; and the mouth-cone is said to extend over the first third or quarter of the mesosternum. From *M. helenæ*, described below, this species differs most conspicuously in the very differently sculptured head and pronotum.

Like the other members of its genus, it is a strikingly beautiful thrips. Though rather sluggish in its gait, it is, remarkably enough, an excellent jumper; and this characteristic, which seems never to have been noted in

a member of its suborder, leads the collector at first to think it a terebrantian.

Macrophthalthrips helenæ, sp. nov.

Female (macropterous).—Length about 1.4 mm. (distended, about 1.8 mm.). Color brown, with intermingled red and opaque white subhypodermal pigmentation. By *reflected* light and in freshly-mounted specimens which have not remained too long in preservative, with a prominent white latero-dorsal stripe extending from the eye to base of head, traversing the prothorax (where it is widened posteriorly), and extending along sides of pterothorax and abdomen to distal third of segment VII; pterothorax with a pair of white spots at sides of mesonotum close to tegulae, another larger pair just laterad of metanotum, and a third pair just behind origin of posterior wings; abdominal segment I largely white; red pigmentation prominent in thorax and segments VII–X of abdomen; eyes bright red. By *transmitted* light, and in specimens which have remained longer in preservative, these white markings are not evident as such but the nearly transparent areas of the cuticula through which the white pigmentation may normally be seen show as pale yellowish markings; the sides of the body, including the head but not the last three abdominal segments, are thus largely yellow and the broad median portion is dark brown; head, thorax, first two abdominal segments and the last four, with much bright red pigmentation; *abdomen dark both dorsally and ventrally in segments II–IV and VIII–X*, segments V and VI paler at sides (VI more broadly so) and VII in basal two-thirds; all coxae blackish brown; middle and hind femora blackish brown and tipped with yellowish, the hind pair more broadly so and paler also at base; *fore femora pale yellowish white throughout, save only for a small brown cloud at base*; fore tibiae yellow, with a nearly black ring around middle; middle and hind tibiae similarly but more darkly and broadly ringed, often somewhat shaded basally; tarsi yellow, with brown cups; wings pale brownish, with a dark median streak; antennae with segment I largely brown and yellowish distally, II yellow, with a dark gray or brown cloud occupying at least the outer portion of distal half or more, III pale yellow in basal three-fifths and abruptly gray-brown beyond, with constricted apical portion often decidedly paler, IV and V with basal two-fifths or half pale yellow and nearly blackish brown beyond, VI usually yellow *shading to light brown* in distal third or more, VII + VIII blackish brown.

Head about 1.42 times as long as greatest width (which is near base) and about 1.8 times as long as width across eyes, the cheeks nearly parallel in basal two-thirds and curving to eyes anteriorly, where they are very minutely serrulate; vertex produced, overhanging, bearing the partially obscured median ocellus below its apex, with about four pairs of strong, brown, medially-curved setae at sides in front of posterior ocelli and a nearly straight pair ($23\ \mu$) behind them, its rounded anterior portion with a number of raised longitudinal darker lines of sculpture, the portion behind the ocelli reticulate and with 4–6 slender setae which are shorter than the post-

ocellar pair; dorsal surface of head, in the dark median area (which is about equal in width to the distance across eyes), with anastomosing lines of sculpture, the *reticles all occupied by numerous minute wrinkles*, the pale vitta on each side of head free of sculpture; postocular setæ 24μ , dilated at apex, a minute pair of setæ between them about equal to about 9 scattered pairs in darkened area and to several very inconspicuous ones in the pale vittæ and on profile of cheeks, one or two minute setæ in narrowest part between eyes. *Eyes* normal to the genus, i. e., very large, finely faceted, nearly touching dorsally (about 5μ apart) and completely touching beneath vertex, reniform as seen from above. *Ocelli* of posterior pair with diameter about 0.86 their interval. *Antennæ* with all of segment I and about half of II covered by eyes; *segments VII and VIII fused on dorsal surface. Mouth-cone* long and pointed, *about attaining metasternum.*

Prothorax about 2.4 times as wide across coxæ as median length of pronotum, the last nearly half as long as head, with a deep transverse furrow across middle, in front of which are two pairs of small round impressions, one directly in front of the other, at the inner margin of the white vitta; central dark area nearly quadrangular, *with rather widely-spaced anastomosing lines which form almost complete reticles, the latter all occupied by numerous stipple-like granules or minute wrinkles*; white vittæ marked off into polygonal reticles by faint sculpture; episternum, epimeron, and pronotum fused, no separating suture visible; all usual setæ present, stout, pale, and dilated at tip. *Pterothorax* about equal in width to prothorax; mesonotum transversely, metanotum longitudinally, striate with darker anastomosing lines between which the surface is minutely granulate and stippled in appearance. *Legs* short and slender, the fore femora only half as long as head, the middle tibiæ even shorter; fore tarsus unarmed. *Wings* of normal form; three subbasal setæ almost clear, dilated at apex, about comparable with posterior marginals on pronotum; posterior margin of fore pair usually with 5 (infrequently with 6 or 7) accessory hairs.

Abdomen long and slender, only 0.9 as wide as pterothorax; terga II-VII with a patch of minute spines laterad of the wing-retaining setæ, the spines arising from lines of sculpture, the patches smaller and the spines weaker on the posterior terga, those on VII just distinguishable; tube about 0.44 as long as head, about 1.9 times as long as greatest subbasal width, which is hardly twice the apical width, sides straight; major abdominal setæ knobbed, excepting only the pointed lateral pair on VII and IX, which are respectively 110μ and 116μ ; knobbed dorso-lateral setæ on VII measuring 100μ , on VIII 70μ , on IX 83μ ; terminal setæ pointed, 103μ .

Measurements of paratype (♀): Length about 1.44 mm. (distended, 1.82 mm.); head, length 0.240 mm., greatest width 0.169 mm., width across eyes 0.132 mm.; eyes, length 0.127 mm., width 0.064 mm., interval 0.005 mm.; posterior ocelli, diameter 0.018 mm., interval 0.021 mm.; prothorax, median length of pronotum 0.117 mm., width (inclusive of coxæ) 0.268 mm.; pterothorax, greatest width 0.271 mm.; abdomen, greatest width 0.247 mm.; tube, dorsal length of segment 10, 0.106 mm., greatest subbasal width 0.057 mm., width at apex 0.031 mm. Setæ: anterior

marginals 38 μ , anterior laterals 38 μ , midlaterals 34 μ , epimerals 51 μ , posterior marginals 45 μ , coxals 35 μ .

Antennal segments:	1	2	3	4	5	6	7
Length (μ):	30	47	59	63	53	51	67
Width (μ):	31	33	27	27	23	23	22
Total length of antenna, 0.370 mm.							

Male (macropterous).—Color and structure (including sculpture) as in female. Size much smaller, the length averaging about 1.16 mm. (distended, about 1.44 mm.), the greatest width of pterothorax about 0.224 mm.

Described from 34 females and 3 males, all taken from dead branches on Barro Colorado Island, Canal Zone (type locality), and at Porto Bello, Panamá, July 10–August 10, 1933, by James Zetek and the writer.

Like *M. narcissus* described above, this is closely allied to *M. hemipteroides* (Priesner), from Paraguay, and may be distinguished from it by the same characters. From *narcissus* it may be known by the differently sculptured head and pronotum, the more widely separated eyes, and the differently colored abdomen, fore femora, and sixth antennal segment. The species is named after my wife, in acknowledgment of much help given over a period of several years in collecting and mounting insects of this order.